AMENDMENTS TO THE CLAIMS

This Listing of Claims replaces all prior versions, and listings, of claims in this application.

Listing of Claims:

1. (Currently amended) A crystal of a whole antibody, wherein said crystal is characterized by β-sheet structural content, as indicated by a correlation spectra as compared to the soluble counterpart of said antibody, as determined by FTIR, that is between about 0.8 and about 1.0.

2. (Currently amended) A crystal of a single-chain Fv fragment of an antibody, wherein said crystal is characterized by β-sheet structural content, as indicated by a correlation spectra as compared to the soluble counterpart of said fragment, as determined by FTIR, that is between about 0.8 and about 1.0.

3. (Currently amended) A crystal of an Fab fragment of an antibody, wherein said crystal is characterized by β-sheet structural content, as indicated by a correlation spectra as compared to the soluble counterpart of said antibody fragment, as determined by FTIR, that is between about 0.8 and about 1.0.

4. (Canceled).

5. (Original) The crystal according to any one of claims 1, 2 or 3, wherein said whole antibody or single-chain Fv fragment or Fab fragment is a therapeutic antibody or antibody fragment.

6. (Original) The crystal according to any one of claims 1, 2 or 3, wherein said whole antibody or single-chain Fv fragment or Fab fragment is a polyclonal antibody, or fragment thereof, or a monoclonal antibody, or fragment thereof.

7. (Original) The crystal according to any one of claims 1, 2 or 3, wherein said crystal is a carrier-free pharmaceutical controlled release crystal.

8. (Original) The crystal according to any one of claims 1, 2 or 3, wherein said antibody is selected from the group consisting of: chimeric antibodies, humanized antibodies, non-glycosylated antibodies, bispecific antibodies, human antibodies and mouse antibodies.

9. (Original) The crystal according to any one of claims 1, 2 or 3, wherein said antibody is selected from the group consisting of: IgG, IgM, IgA, IgD, IgE, and serum IgA antibodies.

10. (Original) The crystal according to claim 9, wherein said antibody is selected from the group consisting

of: IgG1, IgG2, IgG3 and IgG4, IgM1 and IgM2, and IgA1 and IgA2 antibodies.

11. (Original) The crystal according to any one of claims 1, 2 or 3, wherein said whole antibody or single-chain Fv antibody fragment or Fab antibody fragment has a greater half life in vivo than the soluble counterpart of said antibody or antibody fragment.

12. (Withdrawn) The crystal according to any one of claims 1, 2 or 3, wherein said antibody is an anti-idiotypic antibody.

13. (Original) The crystal according to any one of claims 1, 2 or 3, wherein the antibody is selected from the group consisting of: Rituximab, Infliximab and Trastuzumab.

14. (Withdrawn) The crystal according to any one of claims 1, 2 or 3, wherein the antibody is selected from the group consisting of:
Abciximab,
Palivizumab,
Murumonab-CD3,
Gemtuzumab,
Trastuzumab,
Basiliximab,
Daclizumab,
Etanercept, and
Ibritumomab tiuxetan.

15. (Original) The crystal according to any one of claims 1, 2 or 3, wherein said antibody is selected from the group consisting of: anti-TNF antibodies, anti-CD3 antibodies, anti-CD20 antibodies, anti-CD25 antibodies, anti-CD33 antibodies, anti-CD40 antibodies anti-HER2 antibodies, anti-HBV antibodies, anti-HAV antibodies, anti-HCV antibodies, anti-GPIIb/IIIa receptor antibodies, anti-RSV antibodies, anti-HIV antibodies, anti-HSV antibodies and anti-EBV antibodies.

16. (Original) The crystal according to any one of claims 1, 2 or 3, wherein said antibody is selected from the group consisting of: antibodies for treating cardiovascular disease, antibodies for treating respiratory disease, antibodies for treating tissue transplant rejection, antibodies for treating organ transplant rejection, antibodies for treating cancer, antibodies for treating inflammatory disease and antibodies used in radioimmunotherapy.

17. (Original) The crystal according to any one of claims 1, 2 or 3, wherein said crystal is labelled.

18. (Original) The crystal according to claim 17, wherein said crystal is labelled with a label selected from the group consisting of radiolabels, enzyme labels, toxins, magnetic agents or drug conjugates.

19. (Currently amended) A dried crystal of a whole antibody, wherein said crystal is characterized by β-sheet structural content, as indicated by a correlation spectra

as compared to the soluble counterpart of said antibody, as determined by FTIR, that is between about 0.8 and about 1.0.

20. (Currently amended) A dried crystal of a single-chain Fv fragment of an antibody or an Fab fragment of an antibody, wherein said crystal is characterized by β-sheet structural content, as indicated by a correlation spectra as compared to the soluble counterpart of said fragment, as determined by FTIR, that is between about 0.8 and about 1.0.

21. (Currently amended) A composition for the release of a whole antibody, a single-chain Fv antibody fragment, or an Fab antibody fragment, said composition comprising:

(a) a whole antibody crystal, a single-chain Fv antibody fragment crystal, or an Fab antibody fragment crystal, and

(b) at least one polymeric carrier, wherein said crystal is characterized by β-sheet structural content, as indicated by a correlation spectra as compared to the soluble counterpart of said antibody or antibody fragment, as determined by FTIR, that is between about 0.8 and about 1.0.

22. (Currently amended) A formulation, said formulation comprising:

(a) a whole antibody crystal, a single-chain Fv antibody fragment crystal, or an Fab antibody fragment crystal, and

(b) at least one ingredient,

wherein said crystal is characterized by β-sheet structural content, as indicated by a correlation spectra as compared to the soluble counterpart of said antibody or antibody fragment, as determined by FTIR, that is between about 0.8 and about 1.0.

23. (Currently amended) A composition for the release of a whole antibody, a single-chain Fv antibody fragment, or an Fab antibody fragment, said composition comprising:

(a) a formulation, wherein said formulation comprises a whole antibody crystal, a single-chain Fv antibody fragment crystal, or an Fab antibody fragment crystal, and an ingredient; and

(b) at least one polymeric carrier, wherein said crystal is characterized by β-sheet structural content, as indicated by a correlation spectra as compared to the soluble counterpart of said antibody or antibody fragment, as determined by FTIR, that is between about 0.8 and about 1.0.

24. (Original) The crystal according to any one of claims 1, 2 or 3, or the composition according to claim 21 or 23, or the formulation according to claim 22, wherein said crystal or composition or formulation has an antibody or antibody fragment crystal concentration greater than about 1 mg/ml.

25. (Original) The crystal according to any one of claims 1, 2 or 3, or the composition according to claim 21 or 23, or the formulation according to claim 22, wherein said

crystal or composition or formulation has an antibody or antibody fragment crystal concentration greater than about 10.1 mg/ml.

26. (Original) The crystal according to any one of claims 1, 2 or 3, or the composition according to claim 21 or 23, or the formulation according to claim 22, wherein said crystal or composition or formulation has an antibody or antibody fragment crystal concentration greater than about 20 mg/ml.

27. (Original) The crystal according to any one of claims 1, 2 or 3, or the composition according to claim 21 or 23, or the formulation according to claim 22, wherein said crystal or composition or formulation has an antibody or antibody fragment crystal concentration greater than about 50 mg/ml.

28. (Original) The crystal according to any one of claims 1, 2 or 3, or the composition according to claim 21 or 23, or the formulation according to claim 22, wherein said crystal or composition or formulation has an antibody or antibody fragment crystal concentration greater than about 100 mg/ml.

29. (Original) The crystal according to any one of claims 1, 2 or 3, or the composition according to claim 21 or 23, or the formulation according to claim 22, wherein said crystal or composition or formulation has an antibody or

antibody fragment crystal concentration greater than about 120 mg/ml.

30. (Original) The crystal according to any one of claims 1, 2 or 3, or the composition according to claim 21 or 23, or the formulation according to claim 22, wherein said crystal or composition or formulation has an antibody or antibody fragment crystal concentration greater than about 200 mg/ml.

31. (Original) The composition according to claim 21 or 23 or the formulation according to claim 22, wherein said antibody or antibody fragment is a therapeutic antibody or antibody fragment.

32. (Original) The composition according to claim 21 or 23, wherein said polymeric carrier is a biodegradable polymer.

33. (Original) The composition according to claim 21 or 23, wherein said polymeric carrier is a biocompatible polymer.

34. (Original) The composition according to claim 21 or 23, wherein said polymeric carrier is a polymer selected from one or more of the group consisting of: poly (acrylic acid), poly (cyanoacrylates), poly (amino acids), poly (anhydrides), poly (depsipeptide), poly (esters), poly (lactic acid), poly (lactic-co-glycolic acid) or PLGA, poly (b-

hydroxybutryate), poly (caprolactone), poly (dioxanone); poly (ethylene glycol), poly ((hydroxypropyl)methacrylamide, poly [(organo)phosphazene], poly (ortho esters), poly (vinyl alcohol), poly (vinylpyrrolidone), maleic anhydride-alkyl vinyl ether copolymers, pluronic polyols, albumin, alginate, cellulose and cellulose derivatives, collagen, fibrin, gelatin, hyaluronic acid, oligosaccharides, glycaminoglycans, sulfated polysaccharides, blends and copolymers thereof.

35. (Withdrawn) The composition according to claim 21 or 23, wherein said polymeric carrier is poly(lactic-co-glycolic acid).

36. (Withdrawn) The composition according to claim 21 or 23, wherein said polymeric carrier is emulsified with poly(vinyl alcohol).

37. (Withdrawn) The composition according to claim 21 or 23, wherein said polymeric carrier is a co-polymer.

38. (Withdrawn) The formulation according to claim 22 or the composition according to claim 23, wherein said ingredient is albumin.

39. (Original) The formulation according to claim 22 or the composition according to claim 23, wherein said ingredient is selected from the group consisting of sucrose, trehalose, lactitol, gelatin, hydroxypropyl-β-cyclodextrin, methoxypolyethylene glycol and polyethylene glycol.

40. (Withdrawn) A method for treating a mammal comprising the step of administering to the mammal an effective amount of a whole antibody crystal, a single-chain Fv antibody fragment crystal, or an Fab antibody fragment crystal.

41. (Withdrawn) A method for treating a mammal comprising the step of administering to the mammal an effective amount of the composition according to claim 21 or 23, or the formulation according to claim 22.

42. (Withdrawn) The method according to claim 41, wherein the composition or formulation is administered by parenteral route, oral route, or by needle-free injection.

43. (Original) A large-batch crystallization method for crystallizing a whole antibody, a single-chain Fv antibody fragment or an Fab antibody fragment, comprising the steps of:

(a) mixing a solution of a whole antibody, a single-chain Fv antibody fragment or an Fab antibody fragment with a crystallization solution or a crystallization buffer; and

(b) agitating said mixture for between about 3 and about 48 hours at a temperature between about -21°C and about 61°C, until crystals of said antibody or said antibody fragment are formed.

44. (Original) The large-batch crystallization method according to claim 43, further comprising the step of drying said crystals by a method selected from the group consisting of: air drying, spray drying, lyophilization, vacuum oven drying and nitrogen gas drying.

45. (Original) The large-batch crystallization method according to claim 43, wherein said temperature is between about between about 4°C and about 37°C.

46. (Original) The large-batch crystallization method according to claim 43, wherein said temperature is between about -20°C to about 4°C.

47. (Original) The large-batch crystallization method according to claim 43, wherein said temperature is between about 22°C and about 61°C.

48. (Original) The large-batch crystallization method according to claim 43, wherein the pH of said crystallization buffer is within a range from about pH 1.9 to about pH 11.1.

49. (Original) The large-batch crystallization method according to claim 43, wherein the pH of said crystallization buffer is within a range from about pH 1.9 to about pH 4.0.

50. (Original) The large-batch crystallization method according to claim 43, wherein the pH of said crystallization buffer is between about pH 3 and about pH 10.

51. (Original) The large-batch crystallization method according to claim 43, wherein the pH of said crystallization buffer is within a range from about pH 9.0 to about pH 11.1.

52. (Currently amended) The large-batch crystallization method according to claim 43, wherein ~~the~~ said crystallization buffer comprises a polyethylene glycol (PEG) concentration (w/v) between about 5 and about 40%.

53. (Currently amended) The large-batch crystallization method according to claim 43, wherein said crystallization buffer ~~contains~~ comprises a polyethylene glycol (PEG) concentration (w/v) between about 1.9% and about 80%.

54. (Currently amended) The large-batch crystallization method according to claim 43, wherein said crystallization buffer ~~contains~~ comprises a polyethylene glycol (PEG) concentration (w/v) between about 1.9% and about 5%.

55. (Currently amended) The large-batch crystallization method according to claim 43, wherein said crystallization buffer ~~contains~~ comprises a polyethylene glycol (PEG) concentration (w/v) between about 20% and about 81%.

56. (Original) The large-batch crystallization method according to claim 43, wherein said crystallization buffer comprises polyethylene glycol (PEG) of a size ranging between about 200 and about 20000.

57. (Original) The large-batch crystallization method according to claim 43, wherein said crystallization buffer comprises polyethylene glycol (PEG) of a size between about 200 and about 80,000.

58. (Original) The large-batch crystallization method according to claim 43, wherein said crystallization buffer comprises polyethylene glycol (PEG) of a size between about 200 to about 400.

59. (Original) The large-batch crystallization method according to claim 43, wherein said crystallization buffer comprises polyethylene glycol (PEG) of a size between about 400 to about 80,000.

60. (Original) The large-batch crystallization method according to claim 43, wherein the concentration in said solution of the antibody or single-chain Fv antibody fragment or Fab antibody fragment to be crystallized is between about 0.01 mg/ml and about 500 mg/ml.

61. (Original) The large-batch crystallization method according to claim 43, wherein the concentration of the antibody or single-chain Fv antibody fragment or Fab antibody

fragment to be crystallized is between about 0.01 mg/ml and about 4 mg/ml.

62. (Currently amended) The large-batch crystallization method according to claim 43, wherein the concentration of the antibody or single-chain Fv antibody fragment or Fab antibody fragment to be crystallized is between ~~above~~ about 10 mg/ml and about 25 mg/ml.

63. (Original) The large-batch crystallization method according to claim 43, wherein the concentration of the antibody or single-chain Fv antibody fragment or Fab antibody fragment to be crystallized is between about 3 mg/ml and about 200 mg/ml.

64. (Currently amended) The large-batch crystallization method according to claim 43, wherein the concentration of the antibody or single-chain Fv antibody fragment or Fab antibody fragment to be crystallized is between ~~above~~ about ~~25~~ 200 mg/ml and about 500 mg/ml.

65. (Original) The large-batch crystallization method according to claim 43, wherein said crystallization buffer has a salt content between about 10 mM and about 400 mM.

66. (Original) The large-batch crystallization method according to claim 43, wherein said crystallization buffer has a buffer concentration between about 0 mM and about 4 M.

67. (Original) The large-batch crystallization method according to claim 43, wherein said crystallization buffer has a buffer concentration between about 0 mM and about 2 mM.

68. (Original) The large-batch crystallization method according to claim 43, wherein said crystallization buffer has a buffer concentration between about 1 M and about 4 M.

69. (Withdrawn) A method for purifying a protein by affinity matrix purification, said method comprising the steps of:

(a) mixing with a binding buffer crystals of a whole antibody, a single-chain Fv antibody fragment or an Fab antibody fragment, wherein said antibody or antibody fragment has affinity for the protein to be purified;

(b) adding a protein solution comprising the protein to be purified to the crystal/buffer mixture;

(c) incubating the protein/crystal/buffer mixture for a time and at a temperature sufficient to permit binding of the protein to the antibody or antibody fragment;

(d) washing the mixture with a wash buffer; and

(e) eluting the protein from the mixture with an elution buffer.

70. (Currently amended) A diagnostic kit for the in vitro detection of an antigen in a sample, said kit comprising:

(a) a crystal of a whole antibody, a crystal of a single-chain Fv antibody fragment or a crystal of an Fab antibody fragment, wherein said antibody or antibody fragment is capable of specifically binding to said antigen; and

(b) one or more reagents for detecting the binding of said antibody crystal or antibody fragment crystal to any antigen in said sample.

71. (Original) The diagnostic kit according to claim 70, wherein said antigen is a viral antigen.

72. (Withdrawn) An *in vitro* diagnostic method for
detecting the presence of an antigen in a sample comprising the steps of:

(a) contacting said sample with a crystal of a whole antibody, a crystal of a single-chain Fv antibody fragment or a crystal of an Fab antibody fragment, wherein said antibody or antibody fragment is capable of specifically binding to said antigen, under conditions which permit said antibody crystal or antibody fragment crystal to bind to any antigen in said sample; and

(b) detecting the binding of said antibody crystal or antibody fragment to any antigen in said sample.

73. (Withdrawn) The diagnostic method according to claim 72, wherein said antigen is a viral antigen.

74. (Original) A large-batch crystallization method for crystallizing a whole antibody, a single-chain Fv antibody fragment or an Fab antibody fragment, comprising the steps of:

(a) mixing a solution of a whole antibody, a single-chain Fv antibody fragment or an Fab antibody fragment with a crystallization solution or crystallization buffer; and

(b) agitating said mixture for between about 5 minutes and about 72 hours at a temperature between about -21°C and about 61°C, until crystals of said antibody or said antibody fragment are formed.

75. (Currently amended) The large-batch crystallization method according to claim 43, wherein said solution of antibody or antibody fragment to be crystallized is produced by a method comprising the steps of:

(a) centrifuging transgenic milk comprising a whole antibody, a single-chain Fv antibody fragment or an Fab antibody fragment, to remove milk fat and produce skim transgenic milk; and

(b) diluting the skim transgenic milk obtained in step (a) with about 250 mM EDTA to produce a solution of clarified skim transgenic milk comprising said antibody or antibody fragment.

76. (Original) The composition according to claim 21 or 23, or the formulation according to claim 22, wherein said whole antibody crystal, single-chain Fv antibody fragment crystal, or Fab antibody fragment crystal is crosslinked.

77. (Withdrawn) A method for treating a mammal comprising the step of administering to the mammal an effective amount of the composition according to claim 76.

78. (Withdrawn) The method according to claim 77, wherein the composition is administered by parenteral route, oral route, or by needle-free injection.

79. (New) A crystal of a whole antibody, a single chain Fv antibody fragment or an Fab fragment, produced by the large-batch crystallization method according to claim 43.

80. (New) A crystal of a whole antibody, a single-chain Fv antibody fragment, or an Fab antibody fragment, wherein said antibody is selected from the group consisting of: chimeric antibodies, humanized antibodies, non-glycosylated antibodies, bispecific antibodies, human antibodies and mouse antibodies.

81. (New) A crystal of a whole antibody, a single-chain Fv antibody fragment, or an Fab antibody fragment, wherein said antibody is selected from the group consisting of: Rituximab, Infliximab and Trastuzumab.

82. (New) A crystal of a whole antibody, a single-chain Fv antibody fragment, or an Fab antibody fragment, wherein said antibody is selected from the group consisting of: anti-TNF antibodies, anti-CD3 antibodies, anti-CD20 antibodies, anti-CD25 antibodies, anti-CD33 antibodies, anti-CD40 antibodies anti-HER2 antibodies, anti-HBV antibodies, anti-HAV antibodies, anti-HCV antibodies, anti-GPIIb/IIIa receptor antibodies, anti-RSV antibodies, anti-HIV antibodies, anti-HSV antibodies and anti-EBV antibodies.

83. (New) A crystal of a whole antibody, a single-chain Fv antibody fragment, or an Fab antibody fragment, wherein said antibody is selected from the group consisting of: antibodies for treating cardiovascular disease, antibodies for treating respiratory disease, antibodies for treating tissue transplant rejection, antibodies for treating organ transplant rejection, antibodies for treating cancer, antibodies for treating inflammatory disease and antibodies used in radioimmunotherapy.